

Prevalence of musculoskeletal disorders among nurses of Jinnah Hospital Lahore

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ABSTRACT

Introduction: Nursing is a professionally challenging and stressful job and nurses are at high risk of developing musculoskeletal disorders. This study was conducted to determine the prevalence of musculoskeletal disorders among nurses of Jinnah Hospital, Lahore.

Methods: A questionnaire-based cross-sectional survey was conducted in Jinnah Hospital, Lahore, which was selected using a convenient sampling technique. A questionnaire comprised of demographic data, risk factors, psychological factors and the Nordic scale, was distributed among 100 nurses. One hundred nurses returned a filled questionnaire response rate of 100 percent. Data was analyzed using SPSS statistics IBM 23.

Results: The prevalence of musculoskeletal disorders in nurses of Jinnah Hospital, Lahore was eighty four percent and the most common site being the lower back 69% followed by shoulders 64%, neck 60% and ankle 56%. Married and morning shift nurses were more prone to MSDs and seventy percent of them were between the age limit of 21 to 30 years. Psychological factors affecting nurses are overburdening (91%), having less break periods (87%) and poor working environment (77%). Standing position (93%), Repetition of work (84%) and holding patients while shifting patients (55%) are the most important risk factors.

Conclusions: A high proportion of nurses reported MSDs at some body sites in their occupational life with lower back injuries the most. Education programs on prevention of musculoskeletal disorders are recommended for nurses in order to reduce the risk of MSDs and promote patients care.

Keywords: MSDs (Musculoskeletal disorders); JHL (Jinnah Hospital, Lahore); Lower back; Shoulders; Nordic questionnaire; Standing position; Posture; Neck; Repetition of work; Stressful job.

1. Introduction

Musculoskeletal disorder is defined as a range of inflammatory and degenerative conditions (Clari et al., 2021) that affect the joints, ligaments, muscles, tendons, peripheral nerves and blood vessels causing aches, pain and functional impairment (Jacquier-Bret & Gorce, 2023). Based on the duration, pain and frequency of the symptoms, MSDs have three degrees (Amin et al., 2020). The World Health Organization (WHO) has given a report in 2006 in which pays attention to the role of stress and work related risk in health care providers citing as an example MSDs is leading cause of sickness absentees among nurses all over the world (Long et al., 2013).

Pakistan is developing country and available resources are very limited which is putting an extra burden on our finance system. Due to the high prevalence of communicable and non-communicable diseases, the numbers of patients visiting the hospitals are very high but the numbers of nurses are very low. According to the Pakistan Nursing Council (PNC) nurse-to-patient ratio should be 1:10 in general areas and 1:2 in specialized areas but it was 1:50 in 2013. Due to the high ratio of patients, the nurses have to perform heavy and stressful duties and it leads nurses towards MSDs. There is a high chance of developing MSDs in computer users, office workers, bankers, musicians, carpenters, and players. In hospital setting mostly affected people are the medical and paramedical staff which includes surgeons, ophthalmologists, pharmacists, doctors and nurses especially those working in emergency departments and operation theatres due to their long-standing (Rathore et al., 2017).

Nursing is a professionally challenging, testing, exhausting and stressful type of job (Rathore et al., 2017). Nurses account for 33% of hospital workforce and 60% of those develop musculoskeletal problems. Nurses are specifically

at high risk of developing musculoskeletal disorders which result in work loss, reduced productivity, and work limitations (Yang et al., 2020). Due to the heavy uplifting weight like when changing the position of patients, the nurses acquire musculoskeletal disorders (Amin et al., 2020).

These are the common causes of rottenness among nurses and affect patient outcomes. There are physiological, psychological, and behavioral reactions to stress that can affect WRMDs directly and indirectly. Psychosocial work factors (e.g., work pressure, lack of control), which can cause stress, might also influence or be related to ergonomic factors such as force, repetition, and posture that have been identified as risk factors for WRMDs (Zare et al., 2021). Physical factors related to musculoskeletal disorders are Back body posture, heavy physical work, repetition of work, repetition of posture, high forces levels etc. Psychological factors are overburden of work, less social support, dissatisfaction from job. Personal factors are age, fitness, health status (Asuquo et al., 2021).

Pakistan health care system is Overburden due to the lack of proper training and training of medical and paramedical staff and also putting additional demand on over occupied HR department. Most of the nurses in Pakistani hospitals are females who have to look after their families which increase the physical and psychological burden (Tariq et al., 2018).

Patient handling and movement tasks are physically demanding, generally performed under unfavourable conditions and often unpredictable in nature. Patients offer multiple challenges including variations in size, physical disabilities, cognitive function, level of cooperation and fluctuations in condition. As a given weight to be lifted, there are awkward postures to lift that weight, uneven weight distribution becomes the major cause of these disorders. Nursing profession has highest occupational injury rate as compare to any other profession (Alam et al., 2023) Physical therapists, who commonly treat patients with MSDs are also at risk of having the same disorders mainly in the upper limbs and lower back because of repetitive and excessive movements at the time of exercise (Gorce & Jacquier-Bret, 2023).

The most commonly occurring injuries due to musculoskeletal stress are neck pain, upper back pain, lower back pain, shoulder pain, joint pain and fascia problems. To overcome these problems, they use a plethora of money thus increasing the cost and decreasing the working days (Long et al., 2013).

In ASIA 12-45% of general population suffer from chronic pain related to these disorders and health professionals are 4 times at high risk of getting these disorders .Incidence of musculoskeletal disorders among both eastern and western nursing population is 40-85% (Sun et al., 2023).

1.1. Purpose

MSDs are predominant nowadays in hospital settings. Nurses are confronted with multiple work-related musculoskeletal disorders or pains. This study strives to assess the prevalence of MSDs among the nurses of Jinnah Hospital, Lahore. Also study has explored the work-related risk factors that caused MSDs among hospital nurses.

1.2. Study Objective

To find the prevalence of MSDs among nurses of Jinnah Hospital, Lahore.

1.3. Research Question

What is the prevalence of MSDs among nurses of Jinnah Hospital, Lahore?

1.4. Operational Definitions

Research: The systematic investigation into a study of materials and sources to establish facts and reach new conclusions. **Hospital:** An institution provides medical and surgical treatment and nursing care for sick or injured people. **WHO:** The world Health Organization is a specialized agency of the United Nations that is concerned with international public health. **Nurse:** The person trained to care for the sick or infirm, especially in a hospital.

Disorder: A disorder is a condition that disturbs the regular and normal functions of body. **Musculoskeletal:** Include both bones and muscles and provide basic framework of body and support. **Joints:** A point where two bones meet in the body and thus provide mobility of body's connecting points of bones. **Ligaments/tendons:** Tough fibrous band of tissues that hold bones together or keeps an organ in place.

2. Methodology

2.1. Study design

We used a cross-sectional study design to determine the prevalence of musculoskeletal disorders among nurses at Jinnah Hospital, Lahore.

2.2. Sampling strategy

A convenient sampling strategy was used because it helps us to collect data more easily and readily in a hospital setting.

2.3. Sample size

100 nurses were selected as a study population to find the results of our study. This sample size was calculated by the population proportional formula of sampling, mentioned here:

$$n = Z^2 1-a/2P (1-P)/E^2 \quad (\text{Lwange \& Lemeshow, 1991})$$

$$P \text{ (Anticipated proportion of prevalence)} = 7.2$$

$$E \text{ (Margin of Error)} = 0.05$$

$$Z^2 1-a/2 \text{ (Confidence Interval)} = 1.96$$

$$n \text{ (Sample Size)} = 100$$

2.4. Setting

Jinnah Hospital, Lahore was chosen.

2.5. Sample Selection

2.5.1. Inclusion Criteria: Jinnah Hospital registered nurses; Minimum experience 2 years; and Age limit between 25 to 55 years.

2.5.2. Exclusion Criteria: Age below 25 or above 55; Experience less than 01 year; Student nurses; and Nurses working in relax wards e.g. Eye Department.

2.6. Instruments

We collect data by using Questionnaire which consists of 4 sections given below:

2.6.1. Demographic factors

We ask about age, marital status, number of children, qualification, nature of job, working experience, shifts and department because they are necessary to know the effect of these factors on musculoskeletal disorders.

2.6.2. Work related risk factors

We ask about different postures like bending, twisting, rotating, heavy weight lifting, pulling and pushing of load, repetition of work /posture and prolonged standing position because these are the main factors that can severely effect on muscles and bones.

2.6.3. Psychological factors

We ask about the burden of work, social support, break periods, working environment, satisfaction with job and any part-time job stress that can affect directly or indirectly musculoskeletal problems in nurses.

2.6.4. Nordic MSH Questionnaire

By this questionnaire we ask about any musculoskeletal problem during last 12 months and about prevention, treatment and interventions taken to eradicate these problems. In this, we ask about all body parts separately. We ask about last seven days' musculoskeletal problems and how many times they went to a physician for check-ups.

2.7. Data collection procedure

The questionnaires were distributed to all nurses. And proper time was given to every nurse to fill out the questionnaire. Each nurse took approximately 15 minutes to fill out the questionnaire. The questionnaire was very easy to understand but questions were explained for better understanding. Information regarding our research purpose was also given.

2.8. Variables

2.8.1. Independent variables

Demographic variables like age, occupation, income, marital status, social support, etc., were taken.

Psychological variables like stress, mental status, spouse support, family support, etc.

Work-related variables like duty hours, experience, awkward postures, prolonged standing, overburden etc.

2.8.2. Dependent variable

Musculoskeletal disorders.

2.9. Statistical analysis

Social packages for statistical analysis (it is software used for statistical analysis, first used for social sciences but nowadays a day's expanded in other fields to analyse statistical data).

SPSS statistics IBM-23 was used to analyse the data that was collected.

2.10. Study duration

We started our research in June 2022 and completed it in November 2022.

2.11. Validity and Reliability

The two most essential criteria to evaluate the data collection instrument are validity and reliability.

Validity is termed as the degree to which an instrument measures what it is intended to measure. In this study content validity was assessed by panel of field experts who checked the appropriateness and relevance of the question about study objectives.

Reliability is the consistency with which an instrument measures the attribute. It is the accuracy of the measuring instrument.

2.12. Ethical consideration

We collected data by following ethical considerations with willingness of each participant and without harming anyone. We ensured the integrity and quality of data and maintained confidentiality and autonomy of participants. We tried our best to maintain privacy during data collection procedure. We informed them about the purpose of our research and their contribution importance for us. We took consent before data collection by providing them consent form. We ensured their safety.

3. Results

This section deals with the analysis and interpretation of data for study “musculoskeletal disorders among nurses” SPSS version IBM 23(statistical package for social science) used for analyzing data. Demographic and other variables are written in the form of frequencies, percentages, graphs.

Table 3.1. Demographic information

Demographic information	Frequency	Percentage
Age		
21-30	70	70.0
31-40	25	25.0
41-50	5	5.0
Other	0	0.0
Qualification		
Diploma	34	34.0
BSc.N	58	58.0
MSc.N	7	7.0
Other	1	1.0
Marital status		
Single	44	44.0
Married	54	54.0
Divorced	1	1.0
Widow	1	1.0
Nature of job		
Contract	25	25.0
Permanent	75	75.0

Number of children		
0-2	78	78.0
3-5	19	19.0
6-8	3	3.0
Other	0	0.0
Working experience		
2-4	61	61.0
5-7	12	12.0
8-10	10	10.0
Other	17	17.0
Shift		
Morning	85	85.0
Evening	11	11.0
Night	4	4.0
Department		
Medical	35	35.0
Surgical	30	30.0
Operation theatres	16	16.0
Emergency	12	12.0
Others	07	07.0

3.1. Demographic knowledge

One Hundred Questionnaires were returned, for an overall response rate of hundred percent. The relationship between demographic factors and musculoskeletal disorders among nurses was very interesting. More than two-thirds of population of nurses lying in the age group of twenty-one to thirty years is experiencing musculoskeletal disorders and one-fourth of total population between thirty-one to forty years of age. Qualification of nurses revealed that BSC nurses were more than fifty-eight percent as compared to Diploma nursing just 34.0 % in sample. Married nurses were more than fifty percent who provide data than single nurses, 44.0%. Permanent nurses were more negatively affected by these disorders than contract base nurses the proportion is 75:25 respectively. Seventy-eight percent nurses had number of children ranging from zero to two and nineteen percent from three to five. The prevalence of MSDs is higher among nurses having working experience of fewer than four years and its 61.0%. Eighty-five percent of nurses work in morning shift. More than one-third were working in the medical department. 30.0% and 16.0% working in surgical departments and operation theaters respectively.

Table 3.2. Risk factors Information

Risk factors Information	Frequency	Percentage
Awkward posture	53	53.0
Yes	47	47.0
No		
Bent and twisted posture	53	53.0
Yes	47	47.0
No		
Standing Position	93	93.0
Yes	07	7.0
No		

Pulling and pushing load more than 50kg	47	47.0
	53	53.0
Yes		
No		
Bearing patient weight while shifting patient	55	55.0
	45	45.0
Yes		
No		
Repetition of work/posture	84	84.0
Yes	16	16.0
No		

3.2. Risk factors knowledge

To know the relationship between risk factors and musculoskeletal disorders questionnaires were analyzed for results. More than half of nurses often worked in awkward posture were affected by musculoskeletal disorders. Awkward posture increase muscle effort and place excessive force on joints, cause musculoskeletal disorders.

Prevalence of these disorders was fifty three percent among those nurses who worked in bent and twisted posture. Bending and twisting posture more than 30 degree increases its chances.

Often standing position is the leading cause of these disorders and affected participants were ninety-three percent. Prolong standing of nurses while caring of patients reduce blood supply to the muscles which accelerates the onset of fatigue and pain in muscles of legs, back and neck. Standing for long time can cause joints of hips, knees, spine and feet to become temporarily immobilized.

47.0% of them pulling and pushing load more than 50kg affected by MSDs. It includes lifting, holding, carrying weights, dragging wheel chairs, shifting patients from one bed to another.

Fifty-five of hundred suffer from MSDs due to the bearing patient weight while shifting patient from one bed to another or from bed to wheelchair.

The most frequently identified factor contributing to the development of musculoskeletal disorders were repetition of posture/work affecting eighty-four percent of nurses. Repetition of posture/work when combined with other factors leads towards musculoskeletal disorders in nurses

Table 3.3. Psychological factors

Psychological factors	Frequency	Percentage
Overburden of work		
Yes	91	91.0
No	09	9.0
Less social support		
Yes	65	65.0
No	35	35.0
Dissatisfaction from job		
Yes	46	46.0
No	54	54.0

Less break periods		
Yes	87	87.0
No	13	13.0
Poor working environment		
Yes	77	77.0
No	23	23.0
Having part-time jobs		
Yes	31	31.0
No	69	69.0

3.3. Psychological factors knowledge

After analyzing the results of psychological factors we concluded that more than ninety percent of nurses were overburdened due to the heavy work, shortage of nurses, and low nurse-to-patient ratio. Overburden of work leads towards stress, fewer break periods, exhaustion and fatigue that leads towards MSDs.

About two thirds of them have less social support which affects them psychologically and enhances stress.

Forty-six percent of nurses were dissatisfied from their job due to hard and fast rules of nursing profession, lack of social support, and low sense of personal accomplishment while fifty-four percent were satisfied.

87% of nurses were suffering from musculoskeletal disorders especially upper and lower limb pain due to the less break periods during duty hours

Poor working environment also affect 77%, due to the stressful environment they provide unqualified care. Part-time jobs also a contributing factor that disturbs above thirty percent of nurses.

Table 3.4. Body parts

Body parts	Frequency	Percentage
Neck		
Yes	60	60.0
No	40	40.0
Shoulder		
Yes	64	64.0
No	36	36.0
Upper back		
Yes	51	51.0
No	49	49.0
Elbow		
Yes	23	23.0
No	77	77.0
Wrist/Hand		
Yes	37	37.0
No	63	63.0
Lower back		
Yes	69	69.0
No	31	31.0

Hips/Thighs

Yes	46	46.0
No	54	54.0

Knees

Yes	44	44.0
No	56	56.0

Ankle/Feet

Yes	56	56.0
No	44	44.0

3.4. Nordic MSH Scale knowledge

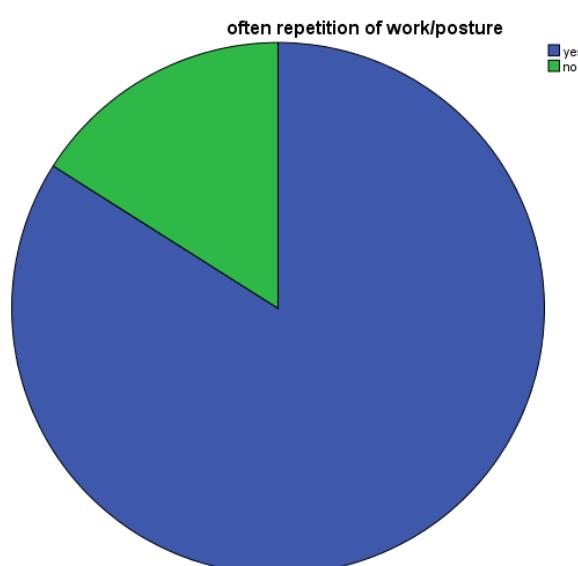
After analyzing the results of the Nordic MSH table we conclude that more than half nurses suffer from neck pain due to the over rotation of neck to focus all sides and to keep sight focused on every aspect and side of patient because every person is a unique person and differs from other.

About 60% of nurses have to face shoulder pain because they have to lift heavy weights when helping patient to shift from one bed to another.

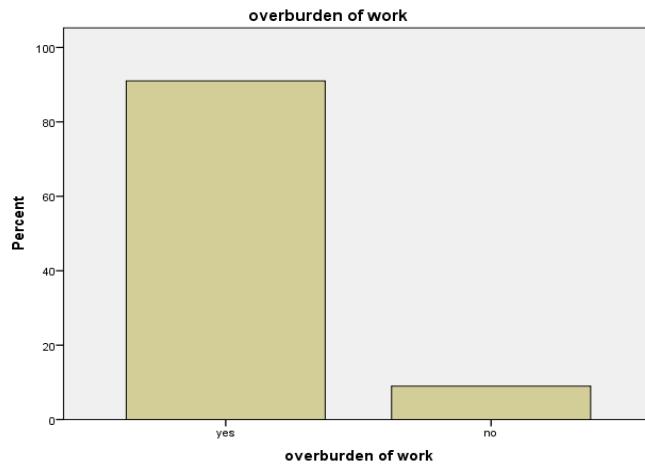
About half nurses bear upper back pain due to overburden of work and repetition of work and long standing in same posture.

The most affected region is the lower back. About 70% of nurses suffer from lower back pain and it has many reasons. Some of these include bending, twisting, repetition of work/posture, long-standing in bending posture, lifting heavy weight while bearing weight on back and overburden of work.

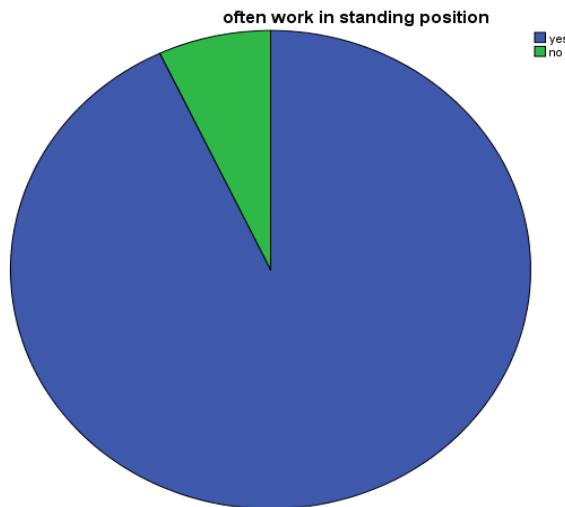
Other body regions are also affected like the hip. Hip joint is affected when more work is done in twisting posture. About half of the nurses experience these problems. Other regions including thighs, knees, and feet also affected but in fewer cases.



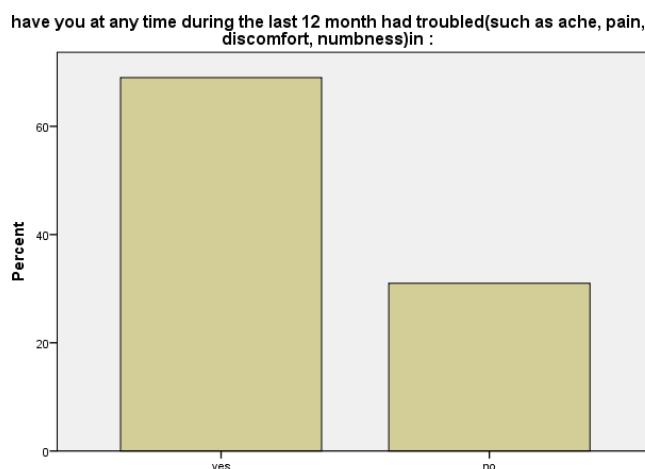
According to Table 3.2, 84% nurses suffering from musculoskeletal disorders due to the repetition of work/posture.



According to Table 03, 91% of nurses' experience musculoskeletal disorders due to the overburden of work when caring for patients.



According to Table 3.2, 93% of nurses bear musculoskeletal disorders due to mostly working in standing positions while delivering care to patients.



According to Table 3.4, 69% of nurses' experience lower back problems during the last 12 months. Problems include aches, pain, discomfort, and numbness.

4. Discussion

Musculoskeletal disorders in nurses are one of the big challenges in Pakistan today. The purpose of this chapter is to provide a significant discussion of our study results in the context of current empirical literature. Up-to-date knowledge about preventive measures can decrease the prevalence of musculoskeletal problems among nurses.

The current study shows that the most affected group of nurses about 70% have aged between 21-30 years in Pakistan in the setting of Jinnah Hospital, Lahore. However, according to (Rathore et al., 2017), only 25.9% of nurses suffer from these disorders in this age limit. This difference is mainly due to the women's early entry into jobs in Pakistan to meet daily needs of life. Women have higher chances of getting a job after completion of nursing education. Performing heavy duties, especially for those nurses who are working in emergency departments and operation theatres and challenging tasks makes them vulnerable to MSDs. Decreased nurse-to-patient ratio, ineffective division of labor that puts extra load on some nurses, a seniority-based mechanism that restrains nurses from working independently, and manual handling like shifting of the patient from one bed to another by nurses. This difference in results is also due to the psychological factors that mentally disturb nurses in Pakistan and eventually affect the physiological functioning of nurses which may lead towards musculoskeletal disorders. It includes marital status that puts strain on their minds when conflicts arise between fulfillment of responsibilities and time management. They have to manage between family expectations and organization expectations. Other confounding factors also contribute in enhancing these factors like working in poor locality and poor environment.

According to our current study nurses having working experience between 3-6 years are mostly affected by musculoskeletal disorders that are about more than fifty percent and it is similar with the results of (Jacquier-Bret & Gorce, 2023). According to his study, about three quarter of nurses having more than 5 years' experience are affected by these disorders.

Throughout the study, it has been noticed that repetition of work is one of the major causes of musculoskeletal disorders. According to our study about 84% of nurses effected that is agreed (Tariq et al., 2018). According to him, about 70% of nurses were affected by the repetition of work.

We found in our study that the prevalence of neck pain since 12 months among nurses is more than half (60%) in Pakistan but this finding is in contrast with the study of (Long et al., 2013) which is only 28%. According to (Rathore et al., 2017) only 10 % of nurses suffer from neck pain during the last 12 months in Pakistan hospitals. one of the reasons for this difference is the environment of ICU and CCU. In ICU and CCU, the environmental temperature is kept low to prevent infection growth in critical patients after surgeries. After critical procedures it was thought that infection could grow easily at the normal temperature of the body that's why the body kept cool by decreasing environment temperature and rushed cool infusions. When nurses work in cold environment and then suddenly move outward in hot environment after duty, then it affects muscles of the body and causes muscle aches, spasms and fatigue. When continuously this situation exists then it becomes a cause of neck pain and other body regions pain.

In this study, results indicate that highest prevalence in 12-month period in nurses according to body region in our study is the lower back. According to our study 69% of the nurses suffering from musculoskeletal disorders mostly

have problems in lower back and it is similar with the results of (Amin et al., 2020). According to his study mostly affected region is the lower back i.e. 44.1%. Perhaps it may have many reasons but one of them is childbearing during pregnancy by nurses can cause low back pain. Our study result about prevalence of lower back pain is also similar with the study result of (Asuquo et al., 2021). According to their study prevalence of lower back pain among nurses is ranging between 73-76%. Major causes of high prevalence are awkward postures nurses maintained during manual handling of patients, prolonged standing, working without sufficient breaks, doing heavy work, bending and twisting etc.

Prevalence of MSDs increase day by day in nurses and other occupational professionals in Jinnah hospital, Lahore owing to less nurse to patient ratio due to overpopulation now a days. According to Pakistan Nursing Council nurse to patient ratio is 1:10 in general areas and 2:3 in specialized areas. One of the reasons for shortage of nurses in nursing industry is the stigma attached with profession. This downward trend is affecting medical care worldwide. Thus low number of nurses and high number of patients put extra load on the shoulders of nurses that move towards more suffering of nurses by these disorders.

5. Conclusion

Based on the findings we conclude that nurses have knowledge about MSD's but practice of using preventive techniques during work is very low. This is an indicative factor of the negligence of higher authority in implementing such nursing practices in JHL. Hence there is need for introducing seminars and training programs for nurse's physiological health improvement and for decreasing the prevalence of MSDs.

5.1. Strength of study

The major strength of this study is that this study gives the current baseline data about the prevalence of MSDs among nurses which will be helpful for improvement of nursing care regarding the prevention of MSDs in JHL.

5.2. Limitations of study

1. A large sample size will be needed to validate findings. In current study, sample size is not large enough to generalize findings to population.
2. Our study was restricted to JHL only. Hence our results cannot equally generalize to other settings in different parts of the country.
3. In our current study we use a non-probability convenient sampling technique which is our limitation.

5.3. Suggestions

1. Replication of the study on a large sample size is required.
2. Barriers predisposing to preventive measures practice need to be identified.
3. Study can be applied to the effectiveness of structured training programs on nurse's knowledge and practice regarding the prevention of MSDs
4. Nurses from different settings should be included in study sample to get better results.

5.4. Implications

1. Nurses should have awareness about MSDs to ensure prevention outcomes. Awareness about MSD should begin with nursing students so that the basis of nurses should be strong to communicate their knowledge with others.
2. Our study findings are suggestive for adding occupational health subject in the academic education of nurses and developing structured training programs for occupational health nurses for awareness about MSD's.
3. Healthcare system should enhance opportunities for better learning to improve awareness and learning about MSD's.
4. Findings of our study show that nurses have knowledge about MSD's but practice element is lacking due to the negligence of senior staff. Our study results suggest that head nurses should check knowledge of staff nurse about MSD's then teach them the manual handling techniques when dealing with patients and preventive measures to save their own physiological health from any harm.
5. We suggest that head nurses should improve staff nurse's skills like how to lift weight, at what angle should bend when working, what proper position should acquire for any procedure performing, how to avoid awkward posture, how to balance between sitting and standing position to avoid fatigue
6. We suggest that tasks should be assigned to nurses according to their specialty and repetition of similar task to same nurse should be discouraged.
7. Hospital administration should arrange skill improvement programs to enhance practice of nurses like conducting seminars to develop awareness about preventive measures to decrease prevalence of MSD's.

6. Abbreviations List

MSD's— Musculoskeletal disorders; Nordic MSH Q— Nordic Musculoskeletal Health Questionnaire; WRMDs— Work Related Musculoskeletal Disorders; ICU— Intensive Care Unit; CCU— Critical Care Unit; OT— Operation Theater; ED— Emergency Department; WHO— World Health Organization; UHS— University of Health Sciences; JHL— Jinnah Hospital Lahore; CON— College of Nursing; AIMC— Allama Iqbal Medical College; PNC— Pakistan Nursing Council; SPSS— Statistical Package for Social Science.

Declarations

Source of Funding

This study did not receive any grant from funding agencies in the public, commercial, or not-for-profit sectors.

Competing Interests Statement

The authors declare no competing financial, professional, or personal interests.

Consent for publication

The authors declare that they consented to the publication of this study.

Authors' contributions

All the authors took part in literature review, analysis and manuscript writing equally.

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